

4 MANTIS OS: an embedded multithreaded operating system for wireless micro sensor platforms

Shah Bhatti, James Carlson, Hui Dai, Jing Deng, Jeff Rose, Anmol Sheth, Brian Shucker, Charles Gruenwald, Adam Torgerson, Richard Han

August 2005 Mobile Networks and Applications, Volume 10 Issue 4

Publisher: Kluwer Academic Publishers

Full text available: pdf(1,27 M8)

Additional Information: full citation, abstract, references, index terms

The MANTIS MultimodAl system for NeTworks of In-situ wireless Sensors provides a new multithreaded cross-platform embedded operating system for wireless sensor networks. As sensor networks accommodate increasingly complex tasks such as compression/aggregation and signal processing, preemptive multithreading in the MANTIS sensor OS (MOS) enables micro sensor nodes to natively interleave complex tasks with time-sensitive tasks, thereby mitigating the bounded buffer producer-consumer problem. To ac ...

Keywords: cross-platform, dynamic reprogramming, embedded operating system, lightweight, low power, multithreaded, sensor networks

Session 31: secure systems: VIRTUS: a new processor virtualization architecture for security-oriented next-generation mobile terminals



③

Hiroaki Inoue, Akihisa Ikeno, Masaki Kondo, Junji Sakai, Masato Edahiro

Proceedings of the 43rd annual conference on Design automation DAC '06

Publisher: ACM Press

Full text available: pdf(798,11 KB)

Additional Information: full citation, abstract, references, index terms

We propose a new processor virtualization architecture, VIRTUS, to provide a dedicated domain for pre-installed applications and virtualized domains for downloaded native applications. With it, security-oriented next-generation mobile terminals can provide any number of domains for native applications. VIRTUS features three new technologies: VMM asymmetrization, dynamic inter-domain communication and virtualization-assist logic, and it is first in the world to virtualize an ARM-based multiproces ...

Keywords: multiprocessor, processor virtualization

Session 3: Energy-aware OS's: Every joule is precious: the case for revisiting





operating system design for energy efficiency Amin Vahdat, Alvin Lebeck, Carla Schlatter Ellis

September 2000 Proceedings of the 9th workshop on ACM SIGOPS European workshop: beyond the PC: new challenges for the operating system EW 9

Publisher: ACM Press

Full text available: pdf(71,97 KB)

Additional Information: full citation, abstract, references, citings

By some estimates, there will be close to one billion wireless devices capable of Internet connectivity within five years, surpassing the installed base of traditional wired compute devices. These devices will take the form of cellular phones, personal digital assistants (PDA's), embedded processors, and "Internet appliances". This proliferation of networked computing devices will enable a number of compelling applications, centering around ubiquitous access to global information serv ...

7 Session summaries from the 17th symposium on operating systems principle



(SOSP'99)

Jay Lepreau, Eric Eide

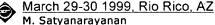
April 2000 ACM SIGOPS Operating Systems Review, Volume 34 Issue 2

Publisher: ACM Press

Full text available: pdf(3,15 MB)

Additional Information: full citation, index terms

⁸ Digest of proceedings seventh IEEE workshop on hot topics in operating systems



October 1999 ACM SIGOPS Operating Systems Review, Volume 33 Issue 4

Publisher: ACM Press

Full text available: pdf(1.67 MB)

Additional Information: full citation, abstract, index terms

The Seventh IEEE Workshop on Hot Topics in Operating Systems was held on March 29-30 1999 at the Rio Rico Resort & Doubtry Club, south of Tucson, Arizona. The General Chair, Peter Druschel, and the Local Arrangements Chair, John Hartman, had gone to considerable effort to make the operation of the workshop smooth and pleasant for the participants. The secluded desert locale, the effect of brilliant sunshine and blue skies on winter-jaded northerners, and the enthusiasm and energy of the ...

Security and eliability: Live updating operating systems using virtualization





Haibo Chen, Rong Chen, Fengzhe Zhang, Binyu Zang, Pen-Chung Yew

Proceedings of the second international conference on Virtual execution environments VEE '06

Publisher: ACM Press

Full text available: pdf(136,71 KB)

Additional Information: full citation, abstract, references, index terms

Many critical IT infrastructures require non-disruptive operations. However, the operating systems thereon are far from perfect that patches and upgrades are frequently applied, in order to close vulnerabilities, add new features and enhance performance. To mitigate the loss of availability, such operating systems need to provide features such as live update through which patches and upgrades can be applied without having to stop and reboot the operating system. Unfortunately, most current live ...

Keywords: availability, live update, operating system, virtualization

¹⁰ Applications and compliance: Virtual monotonic counters and count-limited objects





using a TPM without a trusted OS

Luis F. G. Sarmenta, Marten van Dijk, Charles W. O'Donnell, Jonathan Rhodes, Srinivas

November 2006 Proceedings of the first ACM workshop on Scalable trusted computing STC '06

Publisher: ACM Press

Full text available: pdf(447.59 KB)

Additional Information: full citation, abstract, references, index terms

A trusted monotonic counter is a valuable primitive that enables a wide variety of highly scalable offline and decentralized applications that would otherwise be prone to replay attacks, including offline payment, e-wallets, virtual trusted storage, and digital rights management (DRM). In this paper, we show how one can implement a very large number of virtual monotonic counters on an untrusted machine with a Trusted Platform Module (TPM) or similar device, without relying on a trusted OS ...

Keywords: certified execution, e-wallet memory integrity checking, key delegation, stored-value, trusted storage

Operating systems: t-kernel: providing reliable OS support to wireless sensor



Lin Gu, John A. Stankovic

October 2006 Proceedings of the 4th international conference on Embedded networked sensor systems SenSys '06

Publisher: ACM Press



Additional Information: full citation, abstract, references, index terms

The development of a reliable large-scale wireless sensor network (WSN) is very difficult because of resource constraints, energy budget, and demanding application requirements. Three OS features-OS protection, virtual memory, and preemptive scheduling-can significantly improve the reliability of WSN systems and facilitate developing complex WSN software. However, due to the lack of hardware support for privileged execution and address translation, it is impossible to implement these features wi ...

Keywords: OS protection, binary translation, low-power systems, virtual memory, wireless sensor networks

Security: Raksha: a flexible information flow architecture for software security Michael Dalton, Hari Kannan, Christos Kozyrakis





June 2007

Proceedings of the 34th annual international conference on Computer architecture ISCA '07

Publisher: ACM Press

Full text available: pdf(300.74 KB)

Additional Information: full citation, abstract, references, index terms

High-level semantic vulnerabilities such as SQL injection and crosssite scripting have surpassed buffer overflows as the most prevalent security exploits. The breadth and diversity of software vulnerabilities demand new security solutions that combine the speed and practicality of hardware approaches with the flexibility and robustness of software systems.

This paper proposes Raksha, an architecture for software security based on dynamic information flow tracking (DIFT). Raksha provide ...

Keywords: dynamic, semantic vulnerabilities, software security

Labels and event processes in the asbestos operating system

②

Petros Efstathopoulos, Maxwell Krohn, Steve VanDeBogart, Cliff Frey, David Ziegler, Eddie Kohler, David Mazières, Frans Kaashoek, Robert Morris

October 2005 ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05, Volume 39 Issue

Publisher: ACM Press

Full text available: pdf(258.58 KB)

Additional Information: full citation, abstract, references, citings, index terms

Asbestos, a new prototype operating system, provides novel labeling and isolation mechanisms that help contain the effects of exploitable software flaws. Applications can express a wide range of policies with Asbestos's kernel-enforced label mechanism, including controls on inter-process communication and system-wide information flow. A new event process abstraction provides lightweight, isolated contexts within a single process, allowing the same process to act on behalf of multiple users while ...

Keywords: event processes, information flow, labels, mandatory access control, secure web servers

Security and eliability: A feather-weight virtual machine for windows applications



Yang Yu, Fanglu Guo, Susanta Nanda, Lap-chung Lam, Tzi-cker Chiueh

Proceedings of the second international conference on Virtual execution environments VEE '06

Publisher: ACM Press

Full text available: pdf(192.18 KB)

Additional Information: full citation, abstract, references, index terms

Many fault-tolerant and intrusion-tolerant systems require the ability to execute unsafe programs in a realistic environment without leaving permanent damages. Virtual machine technology meets this requirement perfectly because it provides an execution environment that is both realistic and isolated. In this paper, we introduce an OS level virtual machine architecture for Windows applications called *Feather-weight Virtual Machine* (FVM), under which virtual machines share as many resources ...

Keywords: copy on write, mobile code security, namespace virtualization, system call interception, virtual machine

Operating system enhancements to prevent the misuse of system calls



Massimo Bernaschi, Emanuele Gabrielli, Luigi V. Mancini

November 2000 Proceedings of the 7th ACM conference on Computer and communications security CCS '00

Publisher: ACM Press

Full text available: pdf(413.22 KB)

Additional Information: full citation, references, citings, index terms

Keywords: Linux, access control database, buffer overflow based attacks, isolation, system calls interception

Selected writings on computing: a personal perspective

Edsger W. Dijkstra January 1982 Book

Publisher: Springer-Verlag New York, Inc.

Full text available: pdf(60,98 MB)

Additional Information: full citation, abstract, references, cited by, index terms

Since the summer of 1973, when I became a Burroughs Research Fellow, my life has been very different from what it had been before. The daily routine changed: instead of going to the University each day, where I used to spend most of my time in the company of others, I now went there only one day a week and was most of the time that is, when not travelling!-- alone in my study. In my solitude, mail and the written word in general became more and more important. The circumstance that my employe ...

Bugs as deviant behavior: a general approach to inferring errors in systems code

Dawson Engler, David Yu Chen, Seth Hallem, Andy Chou, Benjamin Chelf

October 2001 ACM SIGOPS Operating Systems Review , Proceedings of the eighteenth ACM symposium on Operating systems principles SOSP '01, Volume 35 Issue

Publisher: ACM Press

Full text available: pdf(1.53 MB)

Additional Information: full citation, abstract, references, citings, index terms

A major obstacle to finding program errors in a real system is knowing what correctness rules the system must obey. These rules are often undocumented or specified in an ad hoc manner. This paper demonstrates techniques that automatically extract such checking information from the source code itself, rather than the programmer, thereby avoiding the need for a priori knowledge of system rules. The cornerstone of our approach is inferring programmer "beliefs" that we then cross-check for contradict ...

Operating systems security: Gray-box extraction of execution graphs for anomaly



detection

Debin Gao, Michael K. Reiter, Dawn Song

October 2004 Proceedings of the 11th ACM conference on Computer and communications security CCS '04

Publisher: ACM Press

Full text available: pdf(254,75 KB)

Additional Information: full citation, abstract, references, citings, index terms

Many host-based anomaly detection systems monitor a process by observing the system calls it makes, and comparing these calls to a model of behavior for the program that the process should be executing. In this paper we introduce a new model of system call behavior, called an <i>execution graph</i>. The execution graph is the first such model that both requires no static analysis of the program source or binary, and conforms to the control flow graph of the program. When used as the m ...

Keywords: anomaly detection, control flow graph, intrusion detection, system call monitor

Security: New cache designs for thwarting software cache-based side channel attacks



Zhenghong Wang, Ruby B. Lee

June 2007 Proceedings of the 34th annual international conference on Computer architecture ISCA '07

Publisher: ACM Press

Full text available: pdf(511,90 KB)

Additional Information: full citation, abstract, references, index terms

Software cache-based side channel attacks are a serious new class of threats for computers. Unlike physical side channel attacks that mostly target embedded cryptographic devices, cache-based side channel attacks can also undermine general purpose systems. The attacks are easy to perform, effective on most platforms, and do not require special instruments or excessive computation power. In recently demonstrated attacks on software implementations of ciphers like AES and RSA, the full key can ...

Keywords: cache, computer architecture, processor, security, side channel, timing attacks

Formalizing the safety of Java, the Java virtual machine, and Java card Pieter H. Hartel, Luc Moreau December 2001



ACM Computing Surveys (CSUR), Volume 33 Issue 4



Additional Information: full citation, abstract, references, citings, index terms

We review the existing literature on Java safety, emphasizing formal approaches, and the impact of Java safety on small footprint devices such as smartcards. The conclusion is that although a lot of good work has been done, a more concerted effort is needed to build a coherent set of machine-readable formal models of the whole of Java and its implementation. This is a formidable task but we believe it is essential to build trust in Java safety, and thence to achieve ITSEC level 6 or Common Crite ...

Keywords: Common criteria, programming

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Computer Security Applications Conference, 2002. Proceedings. 18th Annual 9-13 Dec. 2002 Page(s):403 - 412
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2. Enhancing PC Security with a U-Key

Peng Shaunghe; Han Zhen; Security & Privacy Magazine, IEEE Volume 4, Issue 5, Sept.-Oct. 2006 Page(s):34 - 39 IEEE JNL

3. A case study of secure ATM switch booting

Chuang, S.-C.; Roe, M.; Network and Distributed System Security, 1996., Proceedings of the Symposium on 22-23 Feb. 1996 Page(s):103 - 112 IEEE CNF

4. Alien vs. Quine

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Volume 34, Issue 10, Oct. 2001 Page(s):57 - 66
IEEE JNL

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Cole, B.; Software, IEEE Volume 22, Issue 3, May-June 2005 Page(s):112 IEEE JNL

7. JTRS applications to DoD programs: technology and implementation

Cooper, D.M.; Prill, R.; Horihan, G.; MILCOM 2002. Proceedings Volume 2, 7-10 Oct. 2002 Page(s):1427 - 1432 vol.2 IEEE CNF

8. Secure Bit: Transparent, Hardware Buffer-Overflow Protection

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Security & Privacy Magazine, IEEE

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Advanced Communication Technology, The 9th International Conference on

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Sang-Woo Lee; Yong-Sung Jeon; Ki-Young Kim; Jong-Soo Jang;

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Blankenheim, K.R.; Tate, R.;

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Volume 1, 22-24 April 2003 Page(s):38 - 49 vol.1

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18. The virtual cluster: a dynamic network environment for exploitation of idle resources

De Rose, C.; Blanco, F.; Maillard, N.; Saikoski, K.; Novaes, R.; Richard, O.; Richard, B.; Computer Architecture and High Performance Computing, 2002. Proceedings. 14th Symposium on 28-30 Oct. 2002 Page(s):141 - 148

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23. Understanding trusted computing: will its benefits outweigh its drawbacks?

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